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### ABSTRACT of the Heat Exchanger

A HEAT EXCHANGER specifically designed for heating or cooling of liquids containing SOLID material which has a very unique usage.

- a) in the SEWAGE TREATMENT FACILITIES as a Water to Sludge heater.
- b) in the SEWAGE TREATMENT FACILITIES as a Sludge to Sludge heat recovery unit.
- c) in industrial applications where liquid SLURRIES are required to be heated or cooled.

### **Refer to FIG 1. And FIG 2 and FIG 7**

The Heat Exchanger comprises of horizontally permanently fixed heating plates (12) to define between adjacent heating plates an area of sealed passages for two heat exchanging fluids.

The outer frame comprises of two access doors (20), and two outer walls (26). And two outer door frames (24) to form a permanently fixed rigid structure to provide liquid tight enclosure.

Each heating plate (12) comprises of channels for conducting of the cold or hot liquid sludge in line or counter flow fashion.

The heating plate (12) comprises of vertical directional baffles (14) and round solid bars (34) attached at the end of (14), order to reduce the risk of plugging with stringy material

Each directional baffle (14) has a few PRESSURE RELIEF HOLES (37), (38) or (39) in FIG 7. The pressure relief holes are located at the BOTTOM and has shapes of Square Triangular or Semi Circular.

Each of said channel means being defined by a pair of said heating plates (12) disposed on next to the other and by a pair of directional baffles (14) and an internal return bend means (18).

The internal return bend (18) having a configuration allowing direct access to said channel means at least at one end removable without the necessity to dismantle the entire heat exchanger, the other end could be permanently fixed and liquid tight.